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SHALL EDUCATIONAL OPPORTUNITY BE RESTRICTED?[1]

By A. T. ALLEN
State Superintendent of Public Instruction, Raleigh, N. C.

I WISH to thank the president of your conference for asking me to speak briefly here today. Perhaps my contribution will be very slight.

This conference has been of inestimable service to our department. You have been interested in our problems and sympathetic in our difficulties. Many of our most troublesome questions have been settled upon your floor. We, of course, have not always agreed in every detail, but in the larger purposes and principles we have been together. I wish to register here my sincerest thanks for the friendly attitude which this conference at all times has manifested toward our work. The coöperation of this group has made it possible for us to do many things which we could not otherwise have done.

He who cries that the educational opportunity of today is beyond the economic and social needs of the people is afraid of competition. It is the language of kings and lords and emperors through all the years. It is the refuge of privilege, the enemy of equality, the denial of inherent rights. Whenever it [opportunity] is restricted either in scope or kind, the few benefit at the expense of the many. If all our educational institutions were knocked down, a small per cent of the people would be better off than now, because they would be lords and kings and the rest of us would be slaves.

THE COMMON INTEREST OF SCHOOL AND COLLEGE

Do we have a common interest? Are we working in separate fields and with diverse purposes, or does the prolongation of the student's life through both of our institutions make us mutually inter-dependent? If we did not constantly feed students into the college, you

[1] An address before the North Carolina College Conference, at Durham, October 10, 1930.

would soon go out of business. If you did not constantly send back to us young buoyant life to invigorate our thinking and stimulate our activities, we should soon become atrophied.

What are the elements of union? What is inherent in the situation and in the nature of things that makes all educational effort, in some aspects at least, a common enterprise?

Educational philosophers have worked out and formulated the seven objectives of education. These look upon education as being socially significant which, of course, it is. As such they state well our aims and objectives.

Education and the Individual

I like, however, to look upon education with a tinge of that English philosophy which holds that a group of fine individuals, though different in many ways, serve to make a good community and a good country. Education has also an individual significance. I have tried to word the objective aims of education in terms of the individual. What are we trying to do with or for him—or what are we trying to get him to do for and with himself? The school is no longer a place to which children go merely to recite. Its program is formulated to appeal to the child's potential powers, to provide satisfying and invigorating experiences from which desirable adaptations may come.

The attitude of the teacher is no longer directive and coercive. It means to be persuasive and stimulative. It encourages the child to use his own abilities. It desires him to react for himself and in his own way, and not according to a predetermined formula. It wishes him to grow from within and not by secretions from without. It desires to provide situations that promote physical well-being, intellectual development and moral growth.

Four Fundamental Steps

The four steps contemplated from the standpoint of the individual are the following:

1. *To be an individual in his own name and right.* He wants to be separate and distinct and different from every other individual. He does not desire to be merely one of a group, or a specimen of a kind, but an entity which has value within itself, capable of growth and expansion, and endowed with the power to unfold from within. Such an individual is steadfast and not pliant or subservient. He will not change his outlook, as does the weather cock, with every puff of wind.

The program of activities in the school, with which the child is surrounded, is set to stimulate his moral and intellectual tendencies

into self-activity. Its purpose is not to indoctrinate and to mould. It would not hamper and restrict. Its purpose is to enrich and vitalize. It is positive in effect, not negative; it is dynamic in power, not static. Its dream is not realized in the production of an automaton; but its hope is centered out yonder in an individual human being, active, dominant, virile, and self-directive.

No greater slander was ever uttered against an institution than the oft-repeated jargon that the public school is attempting to make all children alike. The whole enterprise is set up for exactly the opposite purpose. Its whole appeal is to the child as a personality, separate and distinct from his group, differentiated from all into one definite concrete entity, to react to the surrounding situation in his own way and with his own inherent powers.

2. *To be a self-determining individual.* If in this he succeeds, he will be able to carry his own economic load, to sustain his own moral rectitude and vote his own ticket. The old apprentice system put the individual in a groove from which he could not escape, except by almost superhuman effort. If you live in a groove, you will go straight. There will be no turning to the right or left. There will be no expansion. There is no chance to exercise judgment or choice. He is no wiser at 60 than at 20. The high school sets the youth on a plane of opportunity. On that level he is free from many restrictions. There is a wide range of choice. Within the limits of his ability, he can determine for himself the direction his life will take. On that level he can free himself from economic slavery and win gloriously his spiritual freedom and political independence.

3. *To be a coöperative individual.* Coöperation implies a degree of equality among the coöperating agents. A group of individuals—each with the power of self-determination—can meet on this level. If there is not a degree of equality among these people there can be no coöperation. The relationship will be that of king and subject; of lord and serf; of master and slave. Without this equality, which goes along with individual self determination, society becomes stratified and one group sits astride the neck of another. In America we are looking toward a different kind of civilization—one predicated upon the Declaration of Independence—and we have set up the school to sustain it.

4. *To be a participating individual.* Democracy means participation. Our whole governmental fabric rests upon that basis. Every citizen has his part. The state expects him to become capable of playing that part well.

This in brief is what the school is for. This is what Thomas

Jefferson and Horace Mann said it would do for a free people. This is the philosophy which has pushed it forward and caused the American people to pour out their money in almost unlimited millions to support by taxes and philanthropy, an educational program unparalleled in all the world.

If these are desirable characteristics of an individual, and if a collection of such individuals would give us a good community and a good state, then the field of education is an unlimited field, because there is no end to development along these four lines. The situation in which an individual finds himself, or the world in which he lives, determines, to some extent at least, the kind of individual he must be in order to be successful.

The Needs for Education Increase as Civilization Advances

The Indian for his environment and for his mode of life was perhaps well educated. He did not build railroads, automobiles, steamboats, or radios because his mode of life did not call for them. The pioneer also lived simply. He supplied his own wants; he often objected to neighbors; he desired to be left alone, but as neighbors crowded in, it was necessary for his children to have a training different from the original pioneer in order to meet the new conditions. The highly diversified life that we have now with high specialization in the effort to make a living brings about a state of inter-dependence. We sometimes think that the machine age has limited the scope of the individual. In my opinion, the scope is not limited. There is as much room, or more, for individuality now than at any time in the past, but it is a different kind of individuality made necessary by changed conditions which bring about a new attitude and a new program in the whole educational field.

We come here, for instance, to this magnificent hotel and spend as much in one night as a pioneer spent on his whole family in a month. If we are to be able to do this, we must be relieved of a multiplicity of details to which the pioneer gave personal attention. The specialization of the age as the merchant, the physician, the lawyer makes unnecessary the kind of training that was essential to the success of an Indian or a pioneer.

We Must Not Limit Educational Opportunity

There has been a tremendous increase in North Carolina, as well as in the rest of the country, in high school and college enrollment within the last ten years. Is this due to merely a new style of thinking or does it represent something fundamental in our changing con-

ditions? This great rush of students to high school and to college has caused many people to wonder whether too many folks are not trying to go to school, and out of this question has come many plans for limiting the opportunities. The statement is often made that there are too many students in high school and too many students in college, and that a great many of them do not fit into the situation. Does this mean that these people should be excluded because they are what they are, or does it mean that the schools should be modified in such a way as to minister to their needs? Which can be changed more easily, the high school program and college curriculum or the kind of boy or girl that attends? There might be less waste if the school should attempt to adapt itself in place of demanding that the pupil conform to what he finds. There ought to be some place provided for every normal minded person who has a desire to improve himself.

Ours is a civilization in which competition is keen and fierce. A fifteen year old boy could easily begin to function as a pioneer. The Indian youth could readily acquire the knowledge and skill demanded of him. To get ready for the conflict in a highly competitive civilization such as ours requires a much longer time of preparation because the reliance is no longer on physical endurance alone, but largely upon the understanding and activity of one's intellectual faculties. There is no way to slacken our effort or to limit this period of preparation without shifting back into simpler ways of living. When we do that our whole civilization topples.

This increased movement into the schools is not something that has been stimulated from above. It is an upward surge from below, representing, as I see it, a great and fundamental dissatisfaction with conditions as they are and a willingness on the part of many thousand students to improve the total situation by individual improvement. It seems to me, therefore, that our effort as school people should be to encourage, stimulate, and provide rather than to discourage, to hamper, and to limit.

He who cries that the educational opportunity of today is beyond the economic and social needs of the people is afraid of competition. It is the language of kings and lords and emperors through all the years. It is the refuge of privilege, the enemy of equality, the denial of inherent rights. Education must combat it through its effort to reëstablish the individual in the pursuit of his unhindered longings.

The greatest contribution education may make to our civilization is the nourishment it may give to the spirit of democracy; the support

(Continued on page 358)

*THE 1930 HIGH SCHOOL SENIOR EXAMINATIONS**

By M. R. TRABUE
The University of North Carolina

THE HIGH SCHOOL Senior Examination administered to the fourth-year pupils of North Carolina white high schools on February 13, 1930, was of about the same character as that used in 1929, with the addition of a twenty-five-question section on Home Economics as an alternative for those pupils who had not studied Latin, French, or Agriculture. The reliability of the Study Habits section of the test was greatly improved through the use of materials and results which were generously made available to the committee by Miss Gladys Boyington of the North Carolina College for Women. The first half of the reading section was made this year from a newspaper clipping dealing with a national economic situation and the second half from a simple paragraph in a standard textbook on botany. The time limits and the general characteristics of the various units in the test were not changed.

The number of seniors examined was greater by 1297 than the number examined in 1929, while the number of schools was greater by only 17. The committee has observed with interest the steady growth from year to year in the number of students tested and in the sizes of the senior classes of which they are members. Table I shows the frequencies for each size of senior class in 1926, 1928, and 1930.

TABLE I

NUMBERS OF SCHOOLS AND SENIORS TESTED

Size of Class	Number of Schools			Number of Seniors		
	1926	1928	1930	1926	1928	1930
100 +	4	8	8	536	1,200	1,323
75 — 99	5	5	5	432	427	449
50 — 74	13	18	21	739	1,043	1,159
40 — 49	14	9	20	615	402	881
30 — 39	24	39	54	829	1,322	1,772
20 — 29	79	94	144	1,839	2,201	3,480
10 — 19	206	285	287	2,907	3,972	4,094
0 — 9	137	143	146	797	906	942
Total	482	601	685	8,694	11,473	14,100
Median Size	15.1	15.5	16.9	23.5	23.9	25.8

* Report of the Secretary of the Committee on College Admissions. Presented to the North Carolina College Conference, Durham, October 10, 1930.

There were three high schools this year in each of which more than two hundred seniors were tested.

If one assumes that the high school seniors this year were equal in ability with those of last year, he must conclude that the test was not as difficult this year as last. On the other hand, if the test was as difficult as that of last year, then the seniors this year were somewhat more capable than those of last year. We know, at least, that the total number of "Partial Total" points possible in sections B to F was 150 in each year, and that the median senior made 70.1 points this year as compared with 67.1 points last year. This improvement of three answers correct may be due in part to both greater ability and easier questions.

Some evidence on this point may be found from an examination of Table II, which compares the median scores of this year's seniors with those of last year on the corresponding sections of the examination. Some of the sections were easier than last year, and some

TABLE II

COMPARISON WITH LAST YEAR BY SECTIONS OF THE EXAMINATION

Subject or Section	Median Scores Obtained in 1930			Medians in 1929
	By Boys	By Girls	By All	
A. Study Habits	14.3	14.5	14.4	15.3
B1. Reading	13.4	12.7	12.9	14.2
B2. Reading	18.5	17.8	18.0	13.2
C. English Usage	10.3	12.0	11.5	8.5
D. Mathematics	7.5	6.2	6.6	6.7
E. General Science	12.4	11.3	11.7	12.3
F. American History	12.7	11.5	11.6	12.1
GL. Latin	8.5	9.9	9.2	9.1
GF. French	7.8	12.1	10.6	10.7
GA. Agriculture	9.7	7.4	9.2	11.1
GH. Home Economics	9.3	13.9	13.7	....
Age in Years	17.9	17.5	17.7	17.8

of them were more difficult. It is interesting to observe that the boys read as well as the girls, but that they are less able than the girls in English usage and in foreign languages.

Further data regarding the sex differences in the 1930 examination were published in the May issue of *The High School Journal*, pages 212 and following. The report referred to shows that on the "Partial Total" composed of sections B to F, inclusive, the boys who remain in high school until their fourth year answer correctly four or five more questions than do the girls of equal age and grade. Most of this difference is probably due to the fact that the number of girls (8756) who remain in school until they reach the senior

class is 64% greater than the number of boys (5344) who remain to that point. Boys who are not academically inclined tend to leave school and to go to work; but there is little else for the girl to do, so she is more easily persuaded to stay in school, in spite of the low ability and small interest she may have in academic matters.

This conference could probably render a great service to the education of the boys of the state by modifying the college entrance requirements in such ways as would allow and encourage the high schools of the state to offer work in which larger numbers of boys could see real value and take genuine interest. So long as the high schools and colleges offer only a limited body of subject matter, which has not been altered sufficiently to meet the changing needs of life during the past half century, the boys of the state are going to continue to leave the schools in search of something more vital. No sensible person can blame them for wishing to avoid spending their time at tasks which to them appear uninteresting and unprofitable. If the schools wish to have adequate opportunities to influence adolescent boys to love and to cherish those things which are fine, true, and lovely, they must offer these boys something which will attract and hold them in school after they have reached the age at which the law no longer holds them there.

Further evidence regarding the kinds of children for whom our high schools are now well adapted was obtained by classifying the scores according to the positions or vocations of their fathers. Four distinct types of work were considered: (1) Executive, (2) Professional, (3) Skilled labor, and (4) Unskilled labor. The median scores of the children of these four groups were as indicated in Table III.

TABLE III

MEDIAN SCORES ACCORDING TO POSITION OF FATHER

	Executive	Professional	Skilled Labor	Unskilled Labor
Number of Seniors ..	104	674	3,152	5,177
Median Score.....	89.1	85.3	76.8	64.9

This table does not include approximately forty-five hundred seniors whose fathers could not be classified in any of the four groups and about five hundred for whom no adequate information was available. It was impossible to be certain of the meanings of many of the replies given by these children to the questions regarding their fathers' occupations, and the classifications made of the replies are not

as clear-cut as one could desire, but the tabulations we have made do reveal some interesting tendencies.

TABLE IV

MEDIAN SCORES MADE BY CHILDREN OF UNSKILLED LABORERS

Father works with	*No. Seniors*	*Median Score*
Drugs, luxuries, etc.	15	75.0
Furniture, household equipment, etc.	39	73.5
Soap, cleaning fluids, etc.	22	73.3
Insurance, bonds, money, etc.	88	72.8
Dry goods, clothing, shoes, etc.	266	72.5
Coal, stone, oil, etc.	59	72.0
Meat, groceries, etc.	63	72.0
Miscellaneous selling, marketing, etc.	333	70.5
Transportation of passengers and freight	325	70.3
Lumber, building materials, etc.	159	69.9
Books, news, office materials	21	69.3
Crime, politics, and public offices	100	69.0
Tools and machinery	31	68.3
Plumbing, heating, and metal work	18	67.5
Manufacturing	17	65.0
Animals: cows, pigs, chickens, etc.	70	63.5
Plants: vegetables, grains, cotton, etc.	3301	62.0
Fish and sea foods	36	57.0

A similar distribution for the children of executive and professional groups is given in Table V.

TABLE V

MEDIAN SCORES MADE BY CHILDREN OF PROFESSIONAL AND EXECUTIVE GROUPS

Father works with	*No. Seniors*	*Median Score*
Marketing, commercial concerns, etc.	21	95.0
Insurance, bonds, banking, etc.	73	90.2
Transportation	12	90.0
Books, ideas, words, etc.	99	89.1
Tools, fine machinery, etc.	97	88.0
Law and justice	124	87.6
Manufacturing	49	86.8
Health, medicine, etc.	114	83.9
Drugs, luxuries, etc.	13	82.5
Lumber, building materials, etc.	36	81.0
Drygoods, clothing, shoes, etc.	69	80.3
Coal, stone, oil, etc.	21	79.3
Furniture, household equipment, etc.	16	78.0
Plants: vegetables, flowers, grain, etc.	6	60.0

The corresponding tables for the skilled labor and other groups are equally interesting, and equally difficult to interpret. One of the most distressing items in all these tables is that the children of North Carolina's farmers are always at the bottom of the list. Does this mean that the farmer's children are being least well taught in our public schools, or that North Carolina's farming is being done by the most uneducable group of white folks in the state? Perhaps

it is impossible to determine. But the fact is perfectly clear that the children of farmers make lower scores on our high school senior examinations than are made by the children of any other large vocational group. Is it reasonable to continue to expect real estate taxes, levied chiefly on the property of this class of people whose children obtain the lowest results in the high school subjects, to bear the largest part of the financial burden of supporting the public schools?

Our report last year showed that the small high schools have much lower average scores than the large high schools. This year we have gone still further and have studied the amount of elementary education received by pupils in high schools of varying size. Table VI shows the median number of months of elementary education seniors reported having received and the median scores they made, when the schools were classified according to the number of students in the senior classes. There is evidence in Table VI,

TABLE VI

ELEMENTARY EDUCATION AND TEST SCORES BY SIZES OF SENIOR CLASSES

Size of Senior Class	No. of Seniors	No. Months in Elementary School	Median Test Score
1 — 9	942	53.7	66.4
10 — 19	4,094	54.0	64.8
20 — 29	3,480	55.4	66.5
30 — 39	1,772	57.4	71.2
40 — 49	881	57.6	73.1
50 — 59	698	61.2	77.0
60 — 69	318	62.1*	78.6
70 — 79	218	62.2	78.0
80 — 99	374	61.9	82.2
100 +	1,323	62.5	85.0
All Sizes	14,100	55.5	70.1

and in other tabulations which cannot be presented for lack of space, that the larger schools produce higher scores, even when the lengths of the school terms are equal.

Another factor which we have studied this year concerns the relation of the scores made by pupils and the number of school years they had spent in arriving at the end of the senior year in high school. Table VII gives the essential facts from this study.

From Table VII it will be observed that two or more extra years in reaching the senior class is a serious matter, indicating that such a pupil will probably have less than normal ability when he does reach the end of the high school course. The fact that a pupil has

* It will be observed that among the larger high schools the amount of elementary education approaches 63 months as a limit. This is, of course, equivalent to seven years of nine months each.

TABLE VII

RELATION OF MEDIAN SCORE TO NUMBER OF YEARS IN SCHOOL

Years in School	No. Years Repeated	No. of Seniors	Median Score
16	5	8	60.0
15	4	19	67.0
14	3	108	60.0
13	2	727	60.6
12	1	3,260	64.7
11	Normal Progress	7,927	71.6
10	Skipped 1 Grade	1,751	77.7
9	Skipped 2 Grades	260	81.5
8	Skipped 3 Grades	40	76.7
11.6 years spent by median senior		14,100	70.1

skipped one or two grades is, on the other hand, a distinctly favorable sign of superior ability.

If the curriculum and school machinery were thoroughly adjusted to the abilities of these students, there would be just as many who had spent less than eleven years in school as had spent more than eleven years. As the schools of North Carolina are now organized, however, 4122 seniors report that they had spent more than eleven, and only 2051 report that they had spent less than eleven years in getting through the public school course. When one recalls what a small percentage these who have survived are of the total number of pupils who entered the public schools eleven years ago, the severity of the course becomes more apparent. Even among the selected few who survive and reach the senior class, there are twice as many who have had to repeat as there are those who have been allowed to skip a grade.

To satisfy an intellectual curiosity which has been expressed several times in the past, we have tabulated the partial-total scores by counties, and have then combined the counties into three groups: mountain counties, piedmont counties, and coastal plain counties. Because some counties contain cities with large schools in them, we have for each section of the state separated the schools having more than 50 seniors from those having fewer than 50. The chief results of this study appear in Table VIII.

TABLE VIII

MEDIAN SCORES OF SENIORS IN VARIOUS SECTIONS OF NORTH CAROLINA

	Mountain Section	Piedmont Section	Coastal Plain Section
All Seniors	72.1	71.1	68.1
Seniors in Large Schools	78.5	81.6	80.0
Seniors in Smaller Schools	71.2	67.0	65.9

From Table VIII it appears that academic standards, instruction, elimination, ability, equipment, or whatever the factors may be which cause high school seniors to answer more questions on this test, are somewhat higher in the western part of North Carolina than they are in the eastern part. Among the larger high schools, however, the piedmont counties show superior achievements. Watauga County had the highest median score among the counties of the state, with Durham and Macon counties tied for second place. New Hanover County led all others in the coastal plain section.

The committee has not undertaken additional studies this year of the uses made of these tests in your colleges. We understand that it is our task to provide the data for you to use, if you wish. We are confident that the test records are highly reliable and useful, but whether they are used intelligently and effectively in selecting, classifying, and administering your college students depends upon the professional knowledge, skill, and energy of your own college staffs. Having records of previous academic achievement available would of itself do a college no more good than it would do a physician to have available a sheaf of his patients' temperature charts which he never consulted or did not know how to use. Although the committee has been ready each year to give assistance and advice in the use of the scores, it has not felt that it should offer such help until it had been requested. In the same spirit, it has not made any investigations this year of the uses being made of the records which it supplies.

RADIO AND EDUCATION

By Alice Keith

Broadcasting Director, American School of the Air

THE SUBJECT "Radio and Education" is one that should interest every school executive in the United States. Radio is in many ways today more powerful than the press. Its introduction into formal and informal education has been accomplished. Extended use is assured. Is it not the duty of educators to see that this new tool is in the right hands and that it is being used in the best possible way?

The "American School of the Air," which is the first educational project on a national scale to be directed toward the elementary school and junior high schools of the country, is making a sincere effort to have its programs evaluated by educators. Already it has

been found that certain types of broadcasts, particularly the dramatized historic episodes, which are on the air every Tuesday at 2:30 P.M. (E. S. T.) are universally approved. Minor and major criticisms regarding other types of programs have been exceedingly helpful.

Several points in the United States have been selected for studying the programs of the American School of the Air. In Washington, D. C., teachers in junior high schools and several of the elementary schools are reporting their reactions to the superintendent of schools. An experimental unit of the Rural Department of Teachers College, Columbia University, is coöperating with several one-room and consolidated schools near New York and reporting the results to the American School of the Air. Dr. William John Cooper, U. S. Commissioner of Education, has sent out a questionnaire to superintendents which should serve as a valuable check on the comparative merits of the various American School of the Air programs.

A Comparison With Europe

In many ways the United States is behind Europe in its acceptance of radio as an educational agency. There are economic and social reasons for this difference. In European countries all communication is controlled by the government, and radio is considered communication. This sort of control has its advantages and disadvantages.

It is interesting to note in this connection the difference in the educational needs of Europe and of America. One can readily understand why modern languages are popular in Europe when the Budapest station feels obliged to make its announcements in six languages. Some of our own far famed announcers with diction medals would be of little service in Europe. In Amsterdam I turned the dial of a radio and heard Swedish, English, French, German and Czecho-Slovakian spoken within five minutes.

Radio in America

When I saw Mr. Stobart at the meeting of the World Federation of Education in Geneva he expressed great pity for America. "Isn't it a pity," he said, "that the States are doing nothing educational in radio." It happened that the European representative of the Payne fund was standing near by. She had in her hands the first proof of Armstrong Perry's book, "Radio in Education," which described the many educational activities in America. Mr. Stobart was utterly dumbfounded to learn that America has over seventy radio stations devoted exclusively to educational programs and more than 500 put-

ting on some type of education broadcast. With characteristic American rudeness I told him that Great Britain was comparable to a single state in our Union—Iowa, for instance—where successful broadcasts have been carried on for years by the state universities. As a matter of fact, the comparison is not bad. England, like Iowa, is an educational unit. Just as in England, the geographic and economic conditions are pretty much the same throughout the state of Iowa, making certain types of broadcasts universally interesting.

Various Types of Programs

The national broadcasting of a series of school programs in America presents many problems not found in local and state broadcasts. It remains for educators to determine the types of programs best suited to different situations. Fortunately educators are actually doing that very thing. But each new person or organization experimenting seems to profit little by previous mistakes and successes. I am sorry to admit that I myself have learned chiefly by the "trial and error method." Although at various times in my life I had taught in rural schools, the grades, high schools, and universities, I had never taught by radio until 1925. I found out in three years of broadcasting in Cleveland that a program should have certain entertainment values, that it should not be too long, and that it should be so planned as to result in creative work on the part of students. I also learned that classroom conditions could make or break the best of programs. The proper atmosphere should be created before the program commences. Previous information should be given and visual aids should be used. After the broadcast the program should be discussed and some type of creative work should result. Under no conditions should students be crowded into an auditorium.

The Future of Radio

The future of radio in education is very hopeful. Notwithstanding the conflicting opinions and fears of individuals and groups, it is going forward with rapid strides. Those who have vision and perspective do not wish to see experimentation and competition done away with. The United States Office of Education has taken the stand that it will coöperate with any local state or national project which is constructive.

The international broadcast from Europe to American schools inaugurated last May is a precursor of a new type of geography lesson that will doubtless be more or less common in a few years. Perhaps

(Continued on page 373)

BOY SCOUTING IN RURAL SCHOOLS

By J. E. McLEAN
Superintendent of Schools of Rockingham County

THIS ARTICLE will attempt to outline some advantages of scouting to principals and teachers in rural schools. I believe that most of us will agree that the scout program is good, especially is it good for the city or town community. But there are problems of organization in the rural communities that have not been overcome. I think this failure is due largely to the lack of interest on the part of our rural principals and teachers. There is no question but that any time and trouble expended along this line will be amply repaid.

Let me cite a few instances that might help us to appreciate the scout program more fully:

Sometime ago the papers carried an article regarding the number of boys who were chosen by the forty-eight states and the District of Columbia to represent them in the Edison scholarship contest. Thirty-four of them were scouts.

The scout monument in America is only nineteen years old. It has succeeded in enrolling only one out of every seven boys as a scout, but the proportion of scouts to non-scouts among the Edison scholarship candidates was five to seven.

We now have data regarding an entirely different type of boy leader. The 1929 college football captains were questioned and it was found that eighty-six of the one hundred and forty-five who responded were scouts. This means that whereas only one boy out of seven has been a scout, a little better than four out of seven football captains, who are leading the college teams this year, have been members of the Boy Scout organization.

A great deal of remarkable comment has been made by football captains who are scouts, as to how scouting has helped them in football. A few of the comments are:

Of great help to build me up physically.
Learn to be alert always.
Clean moral living and thinking adhered to by scouts.
Keep myself clean mentally and physically and to play the game.
Taught me how to be a good sport as well as a leader.
To stick to one thing.
To play clean, hard and to always fight to the last.
To associate with boys.
It taught me coöperation, team work, leadership, discipline, to hold my temper—think quickly.

The scout handbook states that the purpose of scouting is to develop character, leadership and citizenship, and to teach coöperation, develop initiative and discipline of a different kind than the school. It differs from school by getting the scout to do the things himself—learn by doing.

I do not believe that school folk can afford to ignore such a program as the Scout organization is offering.

Most of the books, articles and programs written for boy needs and about boys are based on surveys and studies of boys in cities and towns; assuming that all boys are alike, which is not true. I am hoping that you will honestly seek to understand the rural boy as he is today so that a basis for safe procedure in program making and leadership of farm boys may be possible.

There is another side to this question that should interest school people. Our athletic program in most schools is for the well developed boy. The small boy physically does not get a chance. There is a grave danger of developing in him an inferiority complex; while in scouting, especially in camping, every boy has something to do that he can do successfully.

The scout program is to fill in between church, home and school. With the development of the automobile, good roads, and improved farm machinery, the farm boy is in need of something to fill up his time—to control that gang spirit found in nearly all boys.

We have attempted this organization along the line of least resistance. In the towns where the boys live near some church, club or other center, it was easy to get enough boys together for a troop. We realize that in rural communities this is not so easy. I have been wondering if we could not organize troops in rural communities in this way, especially in consolidated school districts. Use the school as the center for one or more troops, organizing patrols in each smaller community; these patrols to be led by a larger boy with special training. These patrols should meet in homes in that particular community one week; then all these patrols could meet at the school building once or twice a month with the troop leader; or they might meet once a month at school during school hours, and once a month at night.

It would probably be better if the school man was not the troop leader. Every community ought to furnish a man capable of leadership with the backing and assistance of the school man. I believe this kind of work would lessen the principal's duties instead of adding to them.

WOMEN MATHEMATICIANS UP TO THE YEAR 1900

By LOUISE LONG
West School, Gastonia, N. C.

"MY BONES, bleaching in the sepulcher, will quiver with joy at this new triumph of the 'eternal woman.'"

These words are quoted from an article concerning women mathematicians by M. Gino Loria. In order that you may get the significance of the statement, allow me to summarize briefly the contents of the article and to quote part of the conclusion in which the above words appear. Loria mentions the great women mathematicians up to about the year 1900, and attempts "to answer the question as to whether women as mathematicians are really great and capable of being leaders." He points out in almost all cases mentioned that the women mathematicians up to that time had not pursued "the study as an end in itself," and had in many cases been dependent upon men. He says, "Although in a general way, I am disposed by inclination and by conviction to open the doors of the sanctuary of the exact sciences to whoever wishes to leap upon the threshold, I find myself with regret obliged to make reservations in regard to those whom nature seems to have called to other destinies. Perchance some archaeologist of the future, comparing my reservations with progress in mathematics by women of the coming centuries, will find good arguments for accusing me of having been a man of little faith and a false prophet. My bones, bleaching in the sepulcher, will quiver with joy at this new triumph of the 'eternal woman.'"

HYPATIA

The most brilliant and most ancient of women mathematicians was Hypatia, whom Loria considers as one of the most noteworthy of all the women mathematicians. Hypatia was born about 370 A. D. She was the daughter of Theon of Alexandria. In Gow's *History of Greek Mathematics* we read that "Theon of Alexandria was certainly making astronomical observations in A. D. 365 and 372 and he as certainly held classes for which he prepared his edition of Euclid." He was at the head of the Neaplatonic school in the city of Alexandria. Because of this Hypatia was given "the best training the philosophy of the time could furnish. She seemed to be a better mathematician than her father," and succeeded him as lecturer at the school. She proved such a good one that many students from all

parts of the East were attracted to the Alexandrian school. Among these students was Synesius, afterwards bishop of Ptolemais. He wrote to her letters full of admiration and reverence. The city of Alexandria was proud of her; the magistrates relied upon her judgment to the extent that they would often consult her on important cases. Hypatia was famed not only as a brilliant woman for her time, but she was famed "alike for her beauty, her purity, and her tragic fate."

It is thought that she assisted her father in "a scholia on Euclid and a commentory on the *Almagest*." According to Suidas, Hypatia "wrote commentaries on the *Arithmetica of Diophantus*, on the *Conics of Apollonius*, and on the astronomical canon of Ptolemy."

Emilie de Chatelet

Loria mentions next the name of Emilie de Chatelet of France, but he does so largely as a matter of courtesy because she was a friend of Voltaire. Emilie became a pupil of mathematics under Maupertius and Koenig, turning "her brilliant mind to Euclid, to Newton, to literary classics, to Locke, and to Voltaire." She understood "Newton at least in part," and translated the *Principia*. Emilie also wrote on physics. Loria, however, is of the opinion that she "used science largely as a mask for her follies."

Maria Gaetana Agnesi

Among the women of Italy who have added most to the world's store of mathematical knowledge is Maria Gaetana Agnesi (1718-1799). She was of a higher type than Emilie of France. Her father was professor of mathematics in the University of Bologna. Early in life it was a great desire of hers to enter a convent, but her family was opposed. So from her twentieth year on Maria lived in seclusion at home studying mathematics. In 1752 her father became ill and had to stop teaching. Pope Benedict XIV appointed Maria to her father's chair in the university. This position she filled until her father's death two years later, when she joined the "Blue nuns" at Milan. Because of this action Loria says Maria Agnesi showed the "lack of a real love for the subject." Cajori relates an interesting fact concerning Maria. He says she "was a somnambulist. It often happened that she would fall asleep leaving some problem incompletely solved. Then, in the somnambulist state, she would go to her study, make a light, and complete the solution of the problem. The following morning she would be quite surprised to find her problem completed. Agnesi's work on *Analytic Geometry* is very well known.

Her greatness is attested by the fact that the famous Witch of Agnesi got a part of its name from her.

Caroline Herschel

Caroline Herschel, the next woman mathematician mentioned by Loria, was born at Hanover, Germany, in 1750. When quite young Caroline was trained to wait on members of the household. Her favorite was her brother William, eleven years her senior. She later went with William to Bath to keep house for him, and also to become a concert singer. Soon she gave up her desire to become a singer to devote her time as an assistant astronomer to William, who had discovered Uranus, and now needed her "to copy catalogues, tables, and sometimes whole papers." She set to work "to learn all that was needed for her untried office."

"My dear brother William," she wrote later, "was my only teacher and we began generally where we should have ended; he supposing I knew all that went before." The lessons were not out of books, but consisted of questions and answers at meals or odd moments. Caroline carefully copied these answers in a book—"a miscellaneous jumble of formulae, solutions of problems in trigonometry, rules for the use of tables of logarithms, and the like." Even the multiplication table was carried about in her pocket. Although she never spent a single hour "in the systematic study of astronomy," and although she completed volumes of work, there is no record of any computational error imputed to her. When her brother died, she abruptly ceased her mathematical work.

Maria Mitchell

About the only distinguished American woman mathematician mentioned by Loria is Maria Mitchell, who was born on the island of Nantucket, Massachusetts, August 1, 1818. Her father, too, was a student of astronomy.

An excellent example is given by Maria of the value and care of books of her day. She mentions "that one copy of Colburn's *Algebra* was used by eight children in the Mitchell family, one after the other. The eldest daughter's name was written on the inside of the cover; seven more names followed in the order of their ages, as the book descended." Maria first went to school to her father, and then to Mr. Cyrus Pierce, who later became the principal of the first normal school in the United States. He was especially interested in further developing her taste for the study of mathematics, since she had early

shown remarkable talent in that subject. Even in cleaning a room she showed this taste for mathematics. "If a chair was to be placed, it would be parallel to something; she was exceedingly sensitive to a line out of the perpendicular, and could detect the slightest deviation from that rule." Some of the books she studied at seventeen were Bridge's *Conic Sections,* Hutton's *Mathematics,* and Bowditch's *Navigator.*

In his hospitable home at Nantucket, Maria's father entertained many distinguished scientists of that time. Thus she had advantages which few women of scientific tastes enjoy. When, in 1857, she toured Europe, she carried letters from some of these to great scientists, especially to astronomers and mathematicians. Among the great men she met in Europe was Professor Stokes, then spoken of as the best mathematician in England.

Beginning in 1865, and for a period extending over twenty years or more, Miss Mitchell was a Professor at Vassar College. She taught both mathematics and astronomy. Certainly she stressed the value of mathematics in astronomy by saying "The entrance to astronomy is through mathematics. The laws which govern the motions of the sun, the earth, the planets, and other bodies in the universe, cannot be understood and demonstrated without a solid basis of mathematical learning."

At this time many men and women did not believe the intelligence of women equal to that of men. Miss Mitchell, who some may say was too enthusiastic about her young women and hence not to be trusted, made the following comment concerning one of her classes at Vassar: "I have a class of seventeen pupils, between the ages of sixteen and twenty-two. I allow them great freedom of questioning and am puzzled by them daily. They show more mathematical ability and more originality than I had expected. I doubt whether young men would show as deep an interest. Are there seventeen students in Harvard College who take mathematical astronomy, do you think?"

Miss Mitchell was a member of several learned societies. Among them were the American Academy of Arts and Sciences (she was the first woman elected to membership), the American Philosophical Society, The American Association for the Advancement of Science, and the American Association for the Advancement of Women. She held a Ph.D. from Rutgers Female College, an LL.D. from Hanover College, and an LL.D. from Columbia College. Miss Mitchell died in Lynn, June 28, 1889.

Sónya Kovalevsky

According to Loria, the greatest of all the women mathematicians up to 1900 was Sónya Kovalevsky, a Russian. She was born in Moscow, probably in the year 1850.

Sónya first encountered the domain of mathematics in conversations with an uncle, her father's oldest brother. This uncle was an eccentric man, a dreamer, and an excessive reader. He was particularly fond of reading descriptions of new scientific discoveries, narrating them to Sónya's family at dinner, and leading them in a heated discussion. He had never studied mathematics, but had gotten a certain amount of its knowledge from his reading. Sónya often heard him philosophizing aloud concerning these facts. She says "I heard from him for the first time, for example, about the quadrature of the circle, and about many other things of the same sort—the sense of which I could not of course understand as yet; but which acted on my inspiration, imbuing me with a reverence for mathematics, as for a lofty and mysterious science, which opened out to those who consecrated themselves to it a new and wonderful world not to be attained by simple mortals."

Another circumstance excited Sónya's interest in mathematics. When just a child the Krukovsky family moved to a home in the country. It was their plan to repaper all the rooms, but there were so many that not enough paper was available for one of the rooms. This room happened to belong to the children. It was decided to use common paper on the walls of this room until some could be gotten from St. Petersburg. As is often the case, this time never came, but fortunately so. Some of the common paper used happened to consist of sheets of Ostogradsky's lithographed lectures on the differential and integral calculus, bought by Sónya's father in his youth. The formulae on the sheets so attracted her attention that she often spent hours before "that mysterious wall, trying to decipher even a single phrase, and to discover the order in which the sheets ought to follow each other." These formulae, though incomprehensible to her then, were thus so engraved on her memory that, when, as a girl of fifteen, she took her first lesson in differential calculus, her professor was astonished at the quickness with which she "grasped and assimilated the conceptions of the terms and derivatives just as if she had known them before."

In the year 1867, when Sónya was seventeen, her parents took her to Petersburg to spend the winter. At this time a strong movement was making itself felt among the young people of Russia. There was

an eager desire for knowledge and mental development; it so affected the young girls of Russia that hundreds of them belonging to the best families left their homes in order to go to foreign universities to study. In the majority of cases the parents of these girls opposed such action, and the girls had to resort "to strange tactics to effect their purpose." They sought out young men who held the same views about education and went through a form of marriage with them. Thus escaping from parental authority, they entered the universities; then, by "a mutual agreement" made before the marriage, separated, thereby becoming free to pursue their own individual studies.

Sónya had a sister Aniuta, six years her senior, who was very anxious to attend a university in either Germany or Switzerland. She wanted a dear friend of hers by the name of Inez to go with her. They decided that if either of them succeeded in making a marriage such as was mentioned above, that "the other would obtain permission from her parents to accompany her friend abroad." One day Sónya accompanied Aniuta and Inez to the home of a young man by the name of Kovalevsky, who also desired to go to Germany "to complete his studies." Aniuta, when the opportunity presented itself, proposed. He accepted, but with the condition that he could marry Sónya. This caused the girls much anxiety, for they knew it would be hard to induce Sónya's father to consent to the marriage, especially since the elder sister remained unmarried. As they expected, he refused. Soon afterwards, Sónya, consumed by the burning desire for knowledge, ran away to Kovalevsky's home. She left a note, begging her father to "no longer oppose the marriage." He forgave her and gave his consent to the marriage. After living in Petersburg for six months, the young couple left for Heidelberg, Sónya to study mathematics, and her husband, geology.

From the first Sónya attracted the attention of her professors by her unusual talent for mathematics. Konisberger, professor of mathematics, and Kirchkoff, professor of physics, thought her quite wonderful. They often spoke of her extraordinary mathematical ability. She became so well known in the town that people sometimes stopped in the streets to look at such a "diligent" girl.

In 1870, two years after her entrance at Heidelberg, she went to Berlin to study under the famous Professor Weierstrass, a man then "regarded as the father of modern mathematical analysis." At this time the University of Berlin did not admit women students. When Sónya entreated Weierstrass to give her private lessons, he looked at her "with a certain amount of incredulity," but promised to try her by giving her some problems to solve, problems which he had

given his advanced students in mathematics. He was much amazed when she returned a week later with the problems solved clearly and originally. He said that he found in her "the gift of intuitive genius to a degree he had seldom found among even his older and more developed students." From that time they were friends for life. She was received into the Weierstrass home as a "daughter and sister," and continued her studies under his guidance for four years.

In 1874 she was honored by receiving a doctor's degree from the University of Göttingen because "of three treatises she had written under the guidance of Weierstrass." One of these entitled *Zur Theorie der Partiellen Differential-gleichungen* is considered "one of the most remarkable works she ever published."

Now came a series of events which affected Sónya's life greatly: the death of her father, financial misfortunes of her husband, separation from her husband, and finally his death. "She decided now to make a future for herself and her little daughter."

Through the help and influence of Mittag-Leffler, also a pupil of Weierstrass, she was granted a professorship of mathematics in the University of Stockholm, Sweden. This position was granted for one year only, because of the conservative opposition to the employment of a woman as a university professor. Five years later, though, Professor Leffler secured for her a life-appointment, which she enjoyed just one year.

Soon after this in 1886, while visiting in Paris, she came in contact with Poincaré and other mathematicians. As a result of this, a desire was awakened within her to occupy herself with problems the solution of which was to bring her the highest fame. At Christmas, 1888, "she received in person" from the French Academy of Science the "Prix Bordin," the greatest scientific honor which any woman has ever gained; one of the greatest honors, indeed, to which any one can aspire." The work was entitled "On a Particular Case of the Problem of Rotation of a Heavy Body Around a Fixed Point." The Academy of Sciences considered the work such a remarkable one because of the "extraordinary service rendered to mathematical physics." Because of this wonderful work the prize was doubled in amount.

Sónya died in 1891. "Few deaths have awakened such great and such general regret. From nearly all quarters of the civilized world telegrams of condolence reached the Stockholm University. From the highly conservative University of St. Petersburg, of which she had been made a corresponding member during the last year of her life, down to the Sunday-school in Tiflis and the kinder-garten in Kharkoff, all joined in showing honor to her memory. The women

of Russia decided to raise a monument on her grave in Stockholm. At her burial, carriage-loads of flowers covered the dark, newly-turned earth among the snow-drifts in the Stockholm cemetery. All the papers and reviews contained honorable mention of the unique woman who had brought honor on her sex."

In Conclusion

The reader has no doubt noted, as did Loria, that the interest created and developed in mathematics in each of the above sketches was largely due to association with men who were mathematicians or other scientists. Hypatia's father was both an astronomer and a mathematician; Emilie de Chatelet was a friend of Voltaire; Maria Agnesi's father was a professor of mathematics; Caroline Herschel's brother, an astronomer; Maria Mitchell's father, an astronomer and teacher; Sónya Kovalevsky's great teacher, Weierstrass, a mathematician.

Woman is just now being placed upon an equal footing with man in intelligence. She stands at the entrance to many new things today. "Among them let us hope there is a new valuation of mathematics as a humanizing culture particularly adapted to appeal especially to the twentieth century girl as a fascinating branch of study. Let us hope that in its flowering she may find self-confidence, standards by which to evaluate all learning, a chance to excel, a penetrating insight into the eternal realities, a firm foundation for all she discovers by her intuitive methods, a respect for the pioneers of thought, and a vision of the beauty which shall never perish."

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The English Column

Conducted by PRESTON C. FARRAR

Questions, comments, and brief articles dealing with the teaching of English will be welcomed.

ENGLISH GRAMMAR

DESPITE all the attacks that have been made on the subject of grammar, it seems to have gained rather than lost ground in recent years. That gain, I think, must be due in considerable measure to the growing conviction of teachers that a clear understanding of the essential relations of words in the sentence is indispensable to the best teaching of composition.

But the knowledge of these fundamentals that the average freshman brings with him to college is surprisingly meager. Some of this ignorance is due, of course, to simple neglect of the subject by the teacher, and some of it, perhaps, to the teacher's own ignorance; a good deal of it may be due to the fact that most textbooks in grammar do not lend themselves readily to the best kind of teaching; but much of it is very probably the result of the teacher's use of ineffective methods. This seems to mean that many teachers fail to work out into actual teaching the knowledge of educational theory and principle which they have acquired in the numerous general courses in education which they have taken. I have repeatedly been surprised by the lack of skill shown by teachers or students preparing to be teachers in applying a general principle to a concrete piece of instruction. So I have thought that it might be helpful to young teachers of English to present in this issue one way of applying some accepted principles to the teaching of a particular construction in grammar.

THE SUBJECTIVE COMPLEMENT

Perhaps no other important construction in English causes the teacher so much trouble or seems so hard for many pupils to fix in their minds as the complement of the copulative or linking verb, whatever we may choose to call it. It seems to me unfortunate that we do not all choose to call it the subjective complement, which is by long odds the most satisfactory term because it really defines the construction. If we wish to teach the construction as expeditiously as possible, we shall probably do as many teachers and many grammars do—begin by giving a definition, though some widely used

grammars do not even take the trouble to do that, but simply list the various ways, easy and hard all together, in which nouns and pronouns may be used. Then we shall probably give a few examples for drill. With a very bright class, already interested in the subject, perhaps such a method will serve. With an average or inferior or indifferent group the chances are that we shall not get any very lasting results with such a method. But if we wish to arouse the interest of our pupils and set their minds at work so that they as well as we may get real pleasure out of the process, resulting in the understanding and retention that are likely to come from interest, I think we shall present the matter inductively. In fact I think that most skillful teachers, whatever name they may give to their method, will follow the essential steps of the Herbartians. They will prepare the minds of their pupils by arousing, through curiosity or some other motive, an interest in the new thing, a desire to understand it, and by having them recall the things they already know that will help them to grasp the new ideas. They will present first, not the new general idea or principle, but a goodly number of specific instances of it. They will guide their pupils by skillful questions to observe and compare these concrete examples, and find in them the essential characteristics from which to draw a conclusion. They will let them draw that conclusion for themselves and guide them in wording it accurately. And finally they will give them sufficient opportunity in various forms to apply the new principle.

In presenting the subjective complement to a seventh or eighth grade class I have found some such plan as the following useful. It is assumed that the class is already familiar with subject, predicate, modifiers, and the general nature of the different parts of speech, but has not yet had object or any other complement of the verb. I think the construction is much less likely to give trouble later if it is thoroughly taught before the object is taken up.

PLAN FOR TEACHING THE SUBJECTIVE COMPLEMENT

I. *Preparation*

A. Motivation

Teacher: Have you ever heard any one say, "That's him"? Have you heard people say, "That's he"? Which is right? (There would probably be some difference of opinion in the class.)

Have you heard anyone say, "She looks beautifully"? Have you heard people say, "She looks beautiful"? Which is correct? (Probably difference of opinion.) Should you like to know which form in each case is correct, and why? (This question *may* be quite unnecessary.)

B. Recalling what is already known.

It may be desirable to review briefly subjects, predicate, modifiers; or

or the same purpose may be accomplished by questioning on those constructions in the examples given under II.

II. *Presentation of New Matter*

Call the attention of the class to the following sentences previously written on the board:

A. The next visitor was a tall, dignified old gentleman.
B. The old lady in the next seat seemed very unhappy.
C. On the following day she died.

III. *Observation and Comparison*

What is the subject in A? What is said about it?
What word does the saying? What do you call it?
May not the verb make a whole predicate itself?
Does it in A? (No.) In B? (No.) In C? (Yes.)
What would you say of sentences like these?

A. The visitor was.
B. The old lady seemed.
C. The captain became.
D. The apple tastes.

What do we need to do to the verbs in these sentences? (Complete them.)
What does *a tall, dignified old gentleman* do to the verb *was?* (Complete it.)
(After adding complements to the other sentences, ask similar questions about them.)
What would be a good name to give the expression that completes the predicate? (Get *complement* from the class or give it to them and explain its meaning.
Add other examples to those on the board. Underline complements.

E. He might have been *president.*
F. He remained *senator* for thirty years.
G. These roses smell very *sweet.*
H. (Off by itself) The boy broke the *window.*

IV. *Generalization*

What do all these underlined words do? What shall we call them?
Look closely at these complements. What do you notice about their meaning? Does *gentleman* mean the same thing as any other word in the sentence? Does *unhappy* seem to belong to any other word? Who was unhappy?
(Ask similar questions about the others except H.)
What conclusion do you draw about all these complements?
(They all mean the same thing as the subject or refer to the subject.)
(False generalization)
Can you make a definition of complement? (A word that completes a verb and refers to the subject.)
Are you very sure? How about this one? (The boy broke the window.) Does it? (No.)
But these? (Yes.)
(Partial conclusion)
What would be a good name for these complements? (Work out *subjective.*)

Now look at these verbs. What do you notice about them all? Do any of them represent the subject as acting upon something or somebody else? Are they all used to show the relation between the subject and some other word that belongs with it—that is, to couple or link the subject and the other word? What kind of verbs might we call them, then? (Coupling or copulative verbs. Linking verbs.)

Now let us make our definition of subjective complement more exact by mentioning the kind of verb that it completes.

Pupils make definition. (A subjective complement is a word (or expression) that completes a linking verb and refers to the subject.

V. *Application or Drill.*

Pupils may be required to do any of the following:

A. Identify the subjective complement in sentences given them.

B. Give the syntax of underlined words, most of them subjective complements, in a set of sentences.

C. Make new sentences containing subjective complements.

D. Find examples of the construction in their reading.

The plan suggested above would probably be enough for one day. It by no means completes the necessary instruction. The teacher has still to work out a list of linking verbs, to distinguish between subjective complements that are substantives and those that are adjectives, to teach the case of pronouns in the construction, and to drill pupils in the distinguishing between adverbs modifying the verb and predicate adjectives. But the first and most important thing to do, teaching the essential nature of the construction, will have been done in the first day's work.

Lack of space prevents any discussion at this time of the limitations of the use of the inductive method in teaching grammar or of modifications of it that sometimes are desirable.

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The Mathematics Column

Conducted by H. F. MUNCH

PRACTICAL APPLICATIONS OF SOME ALGEBRAIC PRINCIPLES

THE PRESENT age is one marked by industrialism, commercialism, and pleasure seeking. These three great fields of human activity dominate very largely human endeavor. Few in this generation are content to feed the intellect and exalt the soul or to make out a mere existence. The dominating purpose of our time seems to be for each one of us to take some important part in our industrial or commercial expansion and to become wealthy in order that we may indulge ourselves in present day pleasures. You who think this statement is overdrawn, please consider the throngs who attend a world series baseball game or a modern football game. Then expand your thinking to include all such sports in America and you will see some justification, or at least some excuse, for such a statement.

Education has felt the effects of this prevailing attitude on the part of society. As a result the various subjects in the school curriculum have been called upon to justify their places in the course of study upon the basis of utility alone. Because of the prominent place which mathematics has held for so long a time and because of the amount of time devoted to its study in practically every secondary school, it was one of the first of the studies to be called upon to defend its prominent position in our scheme of secondary education.

Hence we find the advocate of mathematics called upon to speak on practical applications of the various phases of the subject, the implication being that these principles must be of practical value to all pupils of secondary school level. This utilitarian value is often assumed, even though the pupils have not learned the principles of the subject to the mastery level, to say nothing of developing the ability to apply them to life's problems.

The question is asked of the advocate of mathematics, of what practical value is mathematics to the boy who is going to become a farmer, a merchant, a forest ranger, or a boot-black, or to the girl who will soon marry a man from one of these occupations? The answer to the question is that to those who choose such occupations,

high school algebra has little or no practical value. Such an admission on the part of teachers of mathematics will not weaken the cause of the subject but will serve to focus the attention upon those other objectives which are of so much greater significance than its utilitarian value.

If the place of mathematics in the curriculum must be justified on the basis of its practical value to the high school pupil, then it seems no more than fair that the position of English, history, science, music, foreign language and all other subjects be justified on the same basis. If we look at it from this standpoint, how can the English teacher justify four years of required English? Is English literature of any practical use to the boy who becomes a farmer, in hoeing potatoes or driving mules? It has been said that mules understand best a language as far remote from pure and elegant English as the east is from the west. Take boys and girls who are of American parentage. They begin to learn to speak English at the tender age of one year; they use it daily to express their thoughts and desires in the home; they learn to read it in the elementary school and to spell the common words used. They know a little about the structure of sentences and other parts of grammar. Are four years of high school English needed in addition to all this in order that the boy or girl who enters the common walks of life may express his thoughts to the members of his family or his friends and neighbors? To answer this question in the affirmative is absurd. Everyone knows that it is not the expression of thought that is the most troublesome, but thinking thoughts worth expressing. All the worth while thoughts that the average person has may be expressed very well by the use of the English learned in the home and in the elementary school. The crux of the whole matter is this: The time and energy expended by the average high school pupil in studying four years of high school English cannot be justified on the basis of its utilitarian value. Neither can the history, science, or foreign language usually offered be justified in the high school curriculum upon the grounds of their practical value alone. Then why should mathematics be called upon to justify its place simply on the basis of its practical value? Algebra in the secondary school finds its justification in its cultural and disciplinary values. Let the mathematics teacher, therefore, keep these values in mind as he teaches and make a conscious effort to attain them.

Algebra is a servant. It is the handmaiden of physics, chemistry, trigonometry, surveying; it is a tool to be used by the machinist, the electrician, the draftsman, the architect, the engineer and the account-

ant. It has long been the faithful servant in these activities, a servant that has never been found wanting, a servant of surpassing dignity and beauty and poise.

Algebra may be made to serve a practical end in helping the high school pupil to better comprehend certain phases of arithmetic. For example, there are certain rules for determining whether or not a number is exactly divisible by 2, 3, 5, 9, 11, etc. These rules may be proved to the algebra pupil in the following way. Take the general number $100h + 10t + u$. If this number is divided by 2 it may be expressed as $\frac{100h + 10t + u.}{2}$ This in turn reduces to the mixed expression $50h + 5t + \frac{u.}{2}$ In other words, since all of the number but the units digit is here divided by two, if the units digit can be divided by two then the whole number is divisible by 2. In other words if, the units digit is 0, 2, 4, 6, or 8 the number is divisible by 2.

Again, suppose it is desired to prove that if the sum of the digits is divisible by 3, the number is divisible by 3. Again, take $100h + 10t + u$ as any number of 3 digits. When divided by 3 it assumes the form, $\frac{100h + 10t + u}{3}$ which reduces to the mixed expression $33h + 3t + \frac{h + t + u.}{3}$ Since the only part of this number which is not here divided by 3 is $h + t + u$, it is evident that if $h + t + u$ is divisible by 3, the whole number is divisible by 3. Hence any number is divisible by three, the sum of whose digits is divisible by three.

Suppose we wish to prove the rule that if the number formed by the last two digits is divisible by four, the number is divisible by 4. Take a four digit number such as $1000T + 100h + 10t + u$ and divide it by 4. It takes the following form $\frac{1000T + 100h + 10t + u}{4}$ $= 250T + 25h + \frac{10t + u.}{4}$ But $10t + u$ is the number formed by the last two digits and since it is the only part of the number which has not been already divided by 4, it is certain that if *it* is divisible by 4, the whole number is divisible by 4.

Take 5. Use the same number as was used for proving divisibility by 3, namely, $100h + 10t + u$. Divide it by 5 and it becomes $\frac{100h + 10t + u,}{5}$ which is equal to $20h + 2t + \frac{u.}{5}$ Thus it is evident that if the units digit is divisible by 5 the whole number is divisible

by 5. In other words, if the units digit is either 0 or 5, the whole number is divisible by 5.

The corresponding rule for divisibility by 11 is somewhat more complex. Take the general number of four places $1000T + 100h + 10t + u$. When divided by 11, it becomes $\frac{1000T + 100h + 10t + u.}{11}$ When reduced to a mixed number, it is $90T + 9h + \frac{10T + h + 10t + u}{11}$. This may be written as $90T + 9h + \frac{10(T + t) + h + u).}{11}$ Now if $(T + t) = (h + u)$, and if $(T + t)$ is substituted for $(h + u)$, the fractional part of this mixed number becomes $\frac{10(T + t) + (T + t),}{11}$ which equals $\frac{11(T + t).}{11}$ Since the numerator of this fraction is divisible by 11, the original number is divisible by 11 if the sum of the even digits is equal to the sum of the odd digits. But this is not the only case in which a number is divisible by 11. Suppose that $(T + t) - (h + u) =$ some multiple of 11, such as 11x. Then $h + u = (T + t) - 11x$. Substituting this value for $h + u$ in the fractional part of our mixed number above, it becomes $90T + 9h + \frac{10(T + t) + (T + t) - 11x.}{11}$ Adding similar terms in this numerator, we have $90T + 9h + \frac{11(T + t) - 11x.}{11}$ Since $11(T + t) - 11x$ is exactly divisible by 11, it proves that if the difference between the sum of the odd digits and the sum of the even digits is any multiple of 11, the number is divisible by eleven. Some of these proofs are not beyond the comprehension of high school freshmen. The last one given probably should not be given before the junior or senior year. Such proofs as these for some of the rules of arithmetic which were arrived at inductively in the elementary school serve to show the pupil that algebra has a value to him which at first he did not see. Besides, he will soon recognize algebra as a more powerful tool with which to solve problems than he has had before. It also serves to stimulate interest; hence is valuable in the learning process. There are other parts of arithmetic that are made clearer by algebraic processes.

Take for example certain phases of percentage. Case I, Base X rate = Percentage, can not be made clearer by the use of algebra. Case II, percentage and rate given to find the base is made very clear by the use of algebra. For example, A farmer sold milk to a creamery receiving credit for 1045 lbs. of butter fat. If his milk tested

3.8% butter fat, how much milk did he sell? The algebraic solution would of course be

$$\begin{aligned} \text{Let } X &= \text{ amount of milk sold.} \\ .038\,X &= 1045 \\ X &= \frac{1045}{.048} \\ X &= 27{,}500 \text{ lbs.} \end{aligned}$$

For some minds this is simpler than the usual arithmetical solution, which is to say, since 1045 lbs. is 3.8%, one percent is 1045 ÷ 3.8 or 275. lbs. and 100%, or the amount of milk sold, is 100 X 275 or 27,500. Likewise when the base and percentage are given to find the rate, the problem may be very clearly explained by algebra.

When the amount and rate are given to find the base, or the difference and rate given to find the base, the algebraic solution may be made much clearer and simpler than the usual arithmetical one. For example. A merchant sells a suit of clothes for $30 making 20%. What did it cost him?

The usual arithmetical solution is as follows:

$$\begin{aligned} \text{Let } 100\% &= \text{the cost.} \\ 120\% &= \text{the selling price.} \\ 1\% &= 30 = .25 \\ 1\% &= \frac{30}{120} = .25 \\ 100\% &= \$25 \text{ or the cost.} \end{aligned}$$

This solution is fundamentally algebraic. The only difference between it and the algebraic solution is that in the first step 100% is taken to represent the cost instead of letting X equal the cost, and then in this solution when 1% is found, it is necessary to find 100%, while in the algebraic solution when X is found the solution is complete. Besides what has been said the subject of interest is more simply and adequately handled by the formula $i = prt$ than by arithmetic. The subject of ratio and proportion is surely clarified and simplified by algebraic processes. In fact, in proportion it is almost universally true that X is used to represent the number sought. Besides all this, the processes used in algebra are so much like many processes in arithmetic and the technique of using generalization as exemplified in algebra so reinforces the application of the specific as used in arithmetic that it is hard to estimate the practical value of algebra in acquiring a thorough mastery of arithmetic.

(To be continued.)

SHALL EDUCATIONAL OPPORTUNITY BE RESTRICTED?

(Continued from page 329)

it renders to the rights of man. It must stand for the enlargement of liberty and the enlightenment of the mind.

Whenever it is restricted, either in scope or kind, the few benefit at the expense of the many. If all our educational institutions were knocked down, a small per cent of the people would be better off than now; because they would be lords and kings and the rest of us would be their slaves. Restrictions and limitations take us in that direction. They widen the gap; they multiply the hurdles; they destroy hope. We are saved, not by the equality of opportunity, but by the excellence and universality of it.

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The History Column

Conducted by A. K. KING

CURRENT HISTORY PUBLICATION

DURING the past month my senior class in American history has been using *The News Review* for current history study. We have found it admirably adapted to our purposes. It is published for Macmillan Company by the *New York Times*. Subscriptions for clubs of over five are 60 cents a semester for each subscriber. The worldwide news service of the *New York Times* is at its disposal. The style and language of the articles are well within the comprehension of the average high school junior. An attractive feature is its wealth of illustration. Among the eight pages of the October 13th issue are found nine pictures, two graphs, one cartoon and one map. There are articles on political, economic, social, international, literary and scientific questions together with several excellent editorials. At last we have a really useful high school weekly newspaper at a moderate price.

For the teacher who is interested in improving her methods of teaching current history Kimball's, *The Teaching of Current Events* (Houghton Mifflin) is an excellent handbook.

WORKBOOKS

DURING the last few years the use of workbooks in the teaching of the social studies has spread rapidly. This has been an outgrowth of the unit idea of organizing materials. There is some danger of one's teaching losing its spontaneity and becoming formal unless these "custom made" lesson plans are used wisely and adapted to the local situation. On the other hand they have been very instrumental in improving the quality of instruction in the social studies. Work books are especially useful and suggestive to inexperienced teachers. In general there are two types of workbooks, those which adhere rigidly to some parent textbook, and those which are adaptable to any good text. Being opposed to "one book" teaching, deponent naturally favors the second type; however, good ones in this class are exceedingly scarce.

A good workbook should be adaptable to the many different interests and abilities one is likely to find in a class. Hence, one which demands the same formal stereotyped reactions from all is of doubt-

ful value. To be adaptable a workbook should contain in addition to the minimum requirements for all a rich and varied list of readings, study questions, map exercises, topics for floortalks, suggested problems and projects, and questions for debate. The physical makeup of the workbook is also important. Its pages should be the same size as standard theme and notebook paper, and the leaves should be perforated so that they can be torn out and given to the pupils in the form of assignments. This allows for flexibility of use, makes it possible to keep other class notes along with the workbook material, and gives the pupil's notebook a personal touch which it does not have if the cheap red, yellow or grey jacket of the publisher is used. It is also necessary to detach objective tests which are frequently printed with the workbook if they are to be of any value. Finally, there is the very practical problem of grading the notebooks. If all the material is bound together the pupils are without them during this period, and, furthermore, twenty-five workbooks are cumbersome to carry around. Since the pages should be detached there should be a one inch margin on the left side of the page. The pupils can punch the pages themselves and by the use of reinforcers insure that they will bear ordinary wear. A good grade of paper should be used. Paper on which ink cannot be used is a nuisance.

The following are some workbooks in history which we have received:

Butcher, W. A. *Work-Test Manual in American History.* The Macmillan Company.

This manual is designed to accompany Beard and Beard, *History of the United States* and is not very adaptable to other texts. The assignments are a series of completion exercises which can be filled in after reading the text. No problems, projects, floortalks, and other activities are provided for. References are given to other texts, but none to supplementary books. The paper is only medium and the margin very narrow. Its strongest feature is a set of fairly good tests for each chapter in the text.

Foister, I. O. and Seehausen, Paul. *Workbook to Accompany Hayes and Moon's Modern History.* The Macmillan Company.

As the title suggests this work is also based on a well known textbook. In makeup and form it is similar to the one above except the margin is slightly wider. The tests are perhaps not as good, and they certainly are not very usable since the ones for the different chapters are crowded into a minimum of space and separate pages are not given each complete test. However, the authors intended for the pupils to use them as self-testing devices.

McKinley, A. E., Howland, A. C. and Wanger, Ruth. *Workbook for World History Today;* and *Workbook for World History in the Making.* American Book Company.

These workbooks are based on the McKinley, Howland and Dann textbooks.

They are well organized and rich in suggestions. Each contains a study outline, list of supplementary and collateral readings, study questions, problems, projects and floor talks. For each unit there is a comprehensive test. Full suggestions and directions for studying are given. There is also an extensive list of texts, general references, biographies and historical fiction in each.

Wilson, H. C. *Laboratory Manual for American History.* American Book Company.

This manual is supposed to be used with Fish, C. R., *History of America,* but it can be used with any good text in American history. With a good library a text could even be dispensed with. This is the best manual that has been prepared to date. It meets practically all the qualifications discussed above. The tests are its weakest feature. There is a very short one for each of the ten units. It is also probable that too many topics have been included—seventy-two in all.

PREPARING LIBRARY BOOKS FOR THE SHELVES

By MARY TERESA PEACOCK
State Director (N. C.) of School Libraries

AS AN AID to the untrained teacher-librarians in the high schools of the state, it has been deemed advisable to carry a series of short articles on the mechanical preparation of school library books for the shelves. The first of these is regarding the accession record.

ACCESSIONING

The accession book is a list of all books in the order in which they are added to the library. No two books ever have the same accession number. Give to each book a number and a line in the accession book. If a volume is bought to replace one lost or worn out, the new volume should *not* be entered under the number of that one lost, but should have a line and number of its own.

After a book has been received and checked with the bill and order list, and examined for imperfections, it should be entered in the accession book and its number written in ink in the book at the bottom of the first page after the title page. The accession book carries information regarding the author's last name, with initials; brief title; publisher; cost; and remarks. Enter only one book to a line, whether a single book or a volume in a set. Each volume of a set is given a separate line and number. Use every line so that no number is omitted.

Date—September 15, 1930

Remarks	Accession Number	Author and Title	Publisher	Cost
Discarded 1930	26	Stein, E.: Gabriel and Hour Book	Page	1.50
	27	Snedeker, C. D.: Beckoning Road	Doubleday	2.00
	28	Linderman, F. B.: American	World Bk.	1.75

By accession number is not meant the catalog number given to the book in the school library list. If we imagine a school without any library books, then the first book received is given "1" as its accession number, the next book is given "2" as its accession number, and so on. If the books already owned by the library have not been given accession numbers, then in numbering the books on hand it does not matter in what order they are numbered. To arrange them on the shelves by subject is perhaps the most satisfactory way. New books should be numbered in the order in which they are received.

The accession number should appear in the book on the leaf after the title page, on the upper right-hand corner of the book pocket and the book card.

This list of library books should be made for both the elementary and high school libraries. It shows a record of all boóks which have belonged to the library and what has become of them.

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Books and Reading

Miss Nora Beust

New Books for the High School

Adams, J. D. *Mountains Are Free.* Dutton. $2.50.

The legend of William Tell forms the background of this thrilling story of Bruno who joins the service of an Austrian knight but later fights with the Freemen of Uri.

Cades, H. R. *Jobs for Girls.* Harcourt. $2.00.

An up-to-date, readable, and practical book for the girl who wants advice on how to find the right job and be successful in it. There are twenty-two different types of work discussed in the light of training, salary, and definite reference to people in the field. Will be very usable.

Daglish, Eric Fitch. *Life Story of Birds.* Morrow. $3.00.

A clear and interesting account which tells of birds in general, of their courtship, of their nests and nest building, of their eggs, of their food, of migrations and other phases of bird life. Birds are compared and described under the different headings according to their habits and appearances through the seasons. The volume is valuable for the artistic woodcuts with which the author illuminates his text. The book is not one that would be used for the identification of birds but rather to create or further the habit of observation of nature.

Darrow, F. L. *Builders of Empire.* Longmans. $2.50.

Fascinating and human accounts of the men who helped to make America. Chapters on engineers, conquerors of the poles, scientists, inventors, financiers and others who helped to make our civilization. Indexed.

Ferris, Helen. *When I Was a Girl.* Macmillan. $2.50.

The girlhood and early struggles of Schumann-Heink, Janet Scudder, Marie Curie, Jane Addams, and Etsu Sugimoto are told in their own words with introductory material by Miss Ferris. It is a splendid inspirational book for older girls.

Hewes, A. D. *Spice, and the Devil's Cave.* Knopf. $2.50.

A good historical tale which tells in a vivid style the struggles between Venice and Portugal for supremacy of the spice trade.

Irwin, Grace. *Trail-blazers of American Art.* Harper. $2.50.

This is the first book of American artists, and American art for young readers. Eleven men, representing every important phase of art, are introduced in an informal manner that appeals. Gilbert Stuart, George Inners, James Whistler, Joseph Sargent and Thomas Nast are some of the artists presented. The chapter on Howard Pyle includes a concise history of the illustrating of children's books. Twelve illustrations representative of American art.

Kelly, E. P. *Blacksmith of Vilno.* Macmillan. $2.50.

An heroic story of Poland in the year 1832 and of how Stefan's courage helped the patriots to take their stand against the Tsar of Russia. There is mystery, adventure and romance against a background of splendid courage.

Quennell, Marjorie and C. H. B. *Everyday Life in Homeric Greece.* Putnam. $2.50.

An attempt to set the scene and secure the atmosphere of the time of Homer, the educator of Greece. The authors believe that there are many useful people who cannot get joy through solely a literary channel in the approach to Greece. The book is well illustrated and does make the wonders of Greece available in a simply written form which is valuable for immature students.

Sandburg, Carl. *Early Moon.* Harcourt. $2.50.

A selection of seventy poems grouped under the following captions which are characteristic of Sandburg's verse: Pictures of today; Children; Wind and sea; Portraits; Birds and Bugs; Night; and End thoughts. "A short talk on poetry with different kinds of explanations for young people as to how little anybody knows about poetry" is an admirable preface to the verse. The illustrations by James Daugherty are in harmony with the spirit of the book.

Schultz, J. W. *White Beaver.* Houghton. $1.75.

A white boy is the hero of this Indian story which incorporates experiences of the author. The adventure centers around the pursuit of White Beaver, the medicine animal.

Sherwood, Merriam. *Tale of the Warrior Lord.* Longmans. $2.50.

A distinguished prose translation of the spirited story of the "Cid," an artistic book with decorations by Henry C. Pitz.

Skinner, C. L. *Red Man's Luck.* Coward-McCann. $2.50.

Plenty of action, atmosphere and suspense. The book will be a delight to the youngsters looking for adventure. Well written.

Professional

Thirty Books for Young People, a list compiled by Jean C. Roos of the Cleveland Public Library, has been reprinted by the A. L. A. The list, which first appeared in Booklist Books, 1929, contains titles that have proved popular with youthful readers and with their elders as well. The price ranges from 35 cents for ten copies to $5 for 500, obtainable from the A. L. A.

500 Books for the Senior High School Library, compiled by Meta Schmidt under the direction of a committee of the American Library Association, Frances H. Kelly, chairman. The list provides helpful and authoritative information to those seeking first aid for a basic senior high school collection. "Although it has been termed conservative and traditional by some, we offer this as an asset in its favor; it is a mere beginning—a tested foundation, so to speak, upon which the new school librarian can begin to build." The "List" includes classification numbers, Library of Congress card numbers, designates editions and prices, and also has a helpful critical note for each book. This publication may be obtained for seventy-five cents from the A. L. A. 520 N. Michigan Avenue, Chicago, Illinois.

The Latin Column

Conducted by J. Minor Gwynn

Vergilian Prize Won by North Carolina

AGAIN has a national honor come to the classicists of North Carolina. This time distinction has been achieved by Dr. M. H. Griffin, of the Latin Department of the State University, with his prize-winning tribute to Vergil. Dr. Griffin also received his graduate degree at the university, but this year accepted work in Central College, Missouri.

By special arrangement with the *Classical Journal* permission has been obtained to reprint Griffin's prize-winning inscription, which is as follows:

THE CLASSICAL JOURNAL

Volume XXVI OCTOBER, 1930 Number 1

Editorial

PUBLIO VERGILIO MARONI
DULCI DECORI TERRAE ITALIAE
MUSIS HOMERICIS POETAE DILECTISSIMO
MEMORIAQUE AETERNA IN ANIMIS HOMINUM
VATI PACIS UNIVERSAE
DIE NATALI BIS MILLESIMO HOC TESTIMONIUM
PIETATISQUE AC CARITATIS
POPULUS AMERICANUS DEDIT DEDICAVITQUE
ID OCT MCMXXX A D

Note.—This contribution, written by M. H. Griffin of the University of North Carolina, was awarded the prize authorized by the Classical Association of the Middle West and South for "the best tribute to Vergil composed in Latin in a form suitable for a commemorative tablet"; cf. the Classical Journal XXIII (1928), 643. It is employed here as a dedication for this special Vergil number of the Journal.

We have received from the Senior High School, Greensboro, a copy of the May number of their literary magazine, *Homespun*. This is a special Vergilian issue, and is devoted entirely to the poet. Both the appearance and the contents are excellent; there are prose, poetry, drama, book review, all upon Vergilian themes, written and edited by the Latin students of the school. The example set by this publication could be profitably followed by others in honoring the poet.

The special Vergilian number of the *Classical Journal* for October, 1930, contains many articles of interest to the high school teacher. Extra copies of this issue may be obtained for fifty cents from Professor J. O. Lofberg, Secretary-Treasurer, Classical Association of the Middle West and South, Oberlin, Ohio.

Pictures taken by those making the Vergilian Cruise feature Section II of the issue of *Latin Notes* for October, 1930. Classical illustrations of many types are included. The cuts are clear and well arranged. This feature is to be commended, and we would like to see more done along this line. Those desiring extra copies of this number may obtain them by addressing Miss Frances E. Sabin, Service Bureau for Classical Teachers, New York University, Washington Square East, 51 West Fourth Street, New York, N. Y.

LATIN PRACTICE BOOK
FIRST YEAR

Guy C. Forsman

Provides purposeful activity on the part of first year students of Latin. It follows the work outlined for the first year Latin in the General Report of the Classical Investigation recently completed under the direction of the Classical League.

The Aims kept in View are

First: To give the pupil a proper background of Roman life and institutions.

Second: To furnish practice material in vocabulary, syntax and forms as recommended in the report of the Classical Investigation.

Third: To stress the relationship between English and Latin.

Fourth: To enable the student to measure his own progress by the use of test exercises.

WEBSTER PUBLISHING COMPANY, ST. LOUIS, MO.

L. D. Crunkleton, State Representative
P. O. Box 1032, Greensboro, N. C.

The French Column

Conducted by HUGO GIDUZ

POSTERS

S. M. ASKS for suggestions on how to make posters for an exhibit for the county fair, and where to get illustrated French magazines.

One of the simplest ways of getting pupils to work on posters is to have them illustrate the proverbs found in their grammar. This may be done either by original drawings or by cutting out of magazines any kind, pictures that will be fitting. For French pictorial magazines write to Brentano's, Fifth Ave., New York, or Schoenhof's, Washington St., Boston. Posters of the phonetic symbols, with illustrative words, are also effective.

Another procedure is to use simple sentences, such as "I open the door," "We are in school," etc., and illustrate them by pictures cut out of our own magazines. This is especially good for first year pupils.

SOUTH ATLANTIC MODERN LANGUAGE ASSOCIATION

ON November 28 and 29 the South Atlantic Modern Language Association will meet at Davidson College. This will be the third meeting of this association. A worth while program is assured.

WHAT with the regional group meetings of the N. C. E. A. for November and the Modern Language Association of America meeting in Washington during the Christmas holidays, the modern language teachers of this state will have excellent opportunities for hearing much that will be of value concerning our work. In addition to the mere professional value in these meetings there is always the contact with other people in our field, which has fully as much value as listening to papers. We urge all to go to as many of these meetings as possible.

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The Music Column

Conducted by HAROLD S. DYER

WHAT IS SUCCESS?

UNDER the present plan many teachers are compelled to manage the matters of program preparation and rehearsal during hours outside the class schedule. Glee clubs, orchestras and bands are found meeting at four o'clock, at noon, in the evening and even before the daily program begins in the morning. This is plainly an extra effort to all concerned, but may be unavoidable in the minds of the school administrators. The place of the rehearsal is not the subject of comment here. The topic for thought here is: "What is a rehearsal?" Those in charge of music work must continually look ahead to the program needs of each organization under their direction. The band must get ready for the football season. The glee club must be ready to sing at a Hallowe'en program, the celebration of some occasion in the history of the school, county, state or nation. The chorus must keep in mind Thanksgiving, when a concert must be presented for the entertainment of the Parent Teachers Association, a convention of teachers, salesmen, doctors or other gathering. Christmas is always on the mind of the teacher of music for at that time, as perhaps at no other time, the taxpayers want to get a glimpse of the operations of the Department of Music "in all its glory." Which means that every parent wants to see his child perform, and justly so.

Deductive reasoning is hardly necessary to emphasize that school is hardly under way before the teacher of music must be ready to perform some stunts with glee club, band or orchestra. Very well. What is the best means of preparation? There certainly is reason for serious thought here, for the profession suffers from more lost motion due to poorly managed rehearsals than is frequently realized.

At the outset it should be realized that the teacher has to make a plan for the program to be given. This plan should be clearly in mind at every rehearsal. It should be increasingly clear to the mind of every student in the various groups as time passes and the numbers are under preparation. An outline of the program placed conspicuously on the board and allowed to remain there will help to shape

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the problem and stimulate in its preparation. Once stated, this program must remain fixed. There should be no lost motion through substitutions, changes or omissions. Frequently the teacher is guilty of too intimate regard for the tastes and desires of the students. Many students will quickly take advantage of the opportunity to express adversely their opinion of this or that piece of music. After all, it is the business of the student to prepare and perform the music to the best of his ability. This effort alone is sufficient reward, and his taste for the music is certain to improve with repeated experience with it.

Music should be catalogued and filed where it is instantly accessible. The writer urges every glee club director to order octavo music *hinged,* that is, bound with linen tape with inside pages attached to the binding to prevent that most disastrous experience of having pages one and eight but being without the inside sheets which have dropped out and are missing. The small extra expense involved in the process of hinging is well justified. A student librarian should be in charge of the music of every group. This student should be notified in writing what music is wanted for the rehearsal so that at the moment of assembling everything will be ready with music on the desks in advance.

Suppose the glee club of thirty girls is rehearsing. What is the usual routine? Let us suppose the matters of voice tryouts and classification have been completed and the students arrive at the rehearsal hall and go to their places, previously assigned.

Too frequently no preliminary vocal work is done before the first song is rehearsed. Vocal exercises are just as necessary in *any* ensemble of voices as are physical exercises to the candidates for the football team. Two points must be kept in mind in presenting vocal drills:

1. The exercises must actually exercise the voices. This is done by the use of both vowel and consonant drills in a rapid, bright tone. Many good books are available on this point. The teacher should be thoroughly familiar with a graded system which in itself is a project for the year's rehearsals.

2. The exercises must consist in chord studies which permit the student to hear and study his own tone in its relation to the others, and of course thereby train his ear to a satisfactory point of acuteness.

Following the vocal drill, which should never occupy over ten minutes, the first song is attacked without delay.

Pages might be written about the kind of song with which to open the rehearsal. If the program is on the board it is a good plan

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to begin at the beginning and rehearse each song listed for performance, or as many as the period of time will permit.

The writer believes new material should be presented with the tempo about where it is planned for performance. Teachers frequently begin by a study of parts at a slow, plodding tempo in order to insure each singer against falling behind. This is conducive of sluggish mental effort and forms the habit of "stalling" over difficult passages. Furthermore, it is next to impossible to pull a glee club up to the desired tempo after a song has been repeatedly rehearsed more slowly. The glee club can develop reading ability in an amazing manner provided there is no compromise on the matter of individual initiative. Two persons should not be looking on the same sheet of music—each singer should have his own. Sing the song all the way through with the accompaniment, provided it has one, and stop only after every voice has "fallen out" of the reading. Start at the beginning immediately without comment. It will immediately become apparent to the singers that individual effort is being rewarded and they will "dig in" and follow their parts more accurately with each repetition. Keep the tempo up. Do not stop to correct mistakes; there will be ample time for this later. Slip in a word here and there which will stimulate the singers to keep in mind that much-forgotten item "tone." Use the word "listen" frequently. I have heard glee clubs sing whole programs without once actually listening to the effects. A club which reaches such a state of mechanical performance that listening is forgotten is in the third stage of artistic decay. Insist that along with singing just the notes each singer give thought to the dynamic markings as well. If a student can attack his part accurately as to pitch and vowel, he can also employ intelligence as regards the intensity of the tone as well. Reward good work with a word here and there but spend no time whatever on adverse comment. "Talk little and sing more" is worthy of being written in every rehearsal hall.

Space forbids more than preliminary comment on the conduct of a rehearsal. In the next issue of the HIGH SCHOOL JOURNAL the writer will continue with comments on how to bring glee club singing to a state of preparation for public presentation.

"Blessed is the person who gets things done" is so true among musicians that comment is unnecessary.

RADIO AND EDUCATION

(Continued from page 338)

after all the peace pacts and parleys have come and gone it will be discovered that radio has done more to bring about world understanding than any other agency.

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The Science Column

Conducted by C. E. PRESTON

THE SCIENCE Column editor is glad to give space to the accompanying challenge, issued to the science teachers of the state, to engage in a definite project along wide and valuable lines, a project, which, if carried through, should result in great benefit not only from the information collected but also from each person's analysis of his own work. One of the most helpful things to a teacher is an occasional stock-taking that will include, in addition to his physical surroundings, the particular needs and interests of the pupils with whom he works, and his own objectives both informational and in line of pupil-development as applied in his teaching situation. The program which Miss Howell and her co-workers have mapped out is rather far-reaching and ambitious, but a determined and enthusiastic group of workers can accomplish wonders. This is the first year, so, to the editor's knowledge, such a step in the direction of concerted action has been taken by the science teachers. Let us all, therefore, support our newly formed committee with all the coöperation we can possibly extend. Every teacher who participates earnestly in this work is sure to reap the reward at least of getting a better personal grasp upon his own problems, as well as having the satisfaction that comes with helping along a good cause.

RESEARCH COMMITTEE

AT the March, 1930, meeting of the N. C. E. A. the Science Teachers Association, in its business session, created three committees, one of which was the Research Committee. The personnel of this committee for 1930-'31 includes the following: Miss Thelma Howell, Western Carolina Teachers College, Cullowhee, chairman; Miss Sara Branch, New Raleigh High School, Raleigh; Mr. D. C. Christian, Jr., Central Junior High School, Durham. At the time of the creation of the committee, no duties or powers were assigned to it.

The first meeting of the Research Committee was held on May 8, 1930, at 8:00 P. M. in the office of Dr. M. C. S. Noble, Jr., in Raleigh. Members of the committee and invited guests present included: Misses Thelma Howell, chairman, and Sara Branch; Mrs. B. W.

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Wells; Drs. M. R. Trabue, Carleton E. Preston, and M. C. S. Noble, Jr. The purpose of the first meeting was to organize the committee and set up a program of work.

The purpose of the Research Committee, as outlined at the meeting, is to foster investigations of problems relating to science teachers and science teaching. This will be done by:

a. Encouraging membership in N. C. E. A.
b. Organizing groups of teachers who wish to investigate a particular problem.
c. Coöperating with such groups of teachers in the accumulation of data bearing on the problem under investigation.
d. Distributing to all science teachers in the state the information gathered by the groups.
e. Directing the attention of science teachers to matters of interest and importance to the profession.
f. Obtaining speakers for science meetings.

In order to get the science teachers of the state interested in research, letters with enrollment blanks enclosed were sent to superintendents asking that they obtain the names of those teachers in the system who wished to enroll with the research committee. As a beginning, the committee itself will conduct an investigation of *the fundamental principles taught in biology, chemistry, physics, general science,* and *physical geography*. Any science teacher who wishes to participate in this work is asked to enroll. Where any group of science teachers prefer to conduct another investigation, the research committee will render all aid possible by suggesting a problem where asked, by assisting in the outlining of the problem, by coöperating in the collection, publication, and circulation of the reports obtained. While special problems are being investigated, The Bureau of Information and Statistics, State Department of Education under the direction of Dr. M. C. S. Noble, Jr., will conduct an investigation to establish the *status of the science teachers of North Carolina.*

Up to the present time, seventy-nine teachers have expressed a desire to assist in the work of the research committee. Those who have not enrolled, but who desire to do so, are asked to send their names, addresses, and subjects taught to Miss Thelma Howell, Chairman, Western Carolina Teachers College, Cullowhee, N. C.

Two New Biology Tests

Blaisdell, J. G. *Instructional Tests in Biology.* Presson, John M. *Presson Biology Tests.* World Book Company, Yonkers, N. Y. 1930.

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THE former of these is a series of twenty-five tests upon a selected set of topics, measuring chiefly accumulation of factual information rather than ability to think scientifically. One might reasonably inquire just what percent of the information here called for, especially in the line of terminology, is worthy of retention or even of temporary memorization by the average high school pupil.

The latter publication consists of two tests, each in forms A and B, one on plant biology and the other on animal and human biology combined. From this organization of subject matter their use is limited to the end of a semester or a year of work or to exploration of the preparedness of students entering upon higher courses.

Both of these tests seem to the reviewer open to the criticism that other answers than those allowed in the scoring keys are perfectly capable of fitting many of the questions, particularly those of the completion type. To admit the right of various scorers to use their own (good or poor) judgment in accepting these alternative answers is of course to destroy the objectivity of the scoring; on the other hand, not to allow them is unfair to those being tested. When, in addition, questions appear in which the element of personal opinion plays no small figure, one is inclined to lose faith in published new-type tests.

Consider, for example, such questions as the following:

"The chief enemy of forests is (man)." (Answer taken from key.)

"The chief enemy of insects is (birds)." (Answer taken from key.)

Inasmuch as there is absolutely no way of measuring the degree of damage done to forests the world over by fungous diseases or insect pests, or that to insects from parasites of both plant and animal nature, or from larger animals including man himself with all his methods of poisoning, destroying breeding grounds and various other destructive wholesale campaigns, it seems highly unscientific to draw any definite conclusion as to these matters of comparison and to attempt to judge others by the degree to which they concur with the writer's opinion. Were all these things accurately known, such questions would be wholly permissible, but they are not known and can never be.

Occasionally, even in so serious a matter as a standardized test, one finds a touch of the ludicrous. In one form of Presson's test appears this question, and its answer according to the key:

"The age of trees may be determined by their (annular rings. *No credit for* rings *alone.*)" That is to say, the answer, "rings" is not

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acceptable, but "ringed rings" is not only acceptable but the only creditable answer! (Latin *annulus*=ring.) ("The pupil's answer may receive credit if it is not in the key only if it is *unquestionably* the exact equivalent of the answer in the key, or is given as correct in the textbook used by the pupil." Extract from scoring directions.) In using the word "annular" here in place of "annual," which conveys the proper meaning, the test-writer is merely perpetuating an unfortunate but common mistake that probably originated with some person more versed in science than in word-derivation; when, however, this wholly redundant adjective is *required* in an answer where the simple word "rings" is arbitrarily ruled incorrect, one is inclined to wonder just what new shade of meaning it introduces that exerts such an effect upon the scoring.

All things considered, one cannot help hoping that both of these sets of tests may be subjected to further revision before being widely distributed.—C. E. P.

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Hurd, A. W. *Work-Test Book in Physics.* Macmillan. 1930. $.64.

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[For additional notes and comments dealing with special fields, the reader is referred to the special columns in this issue on "History," "Science," and "Books and Reading."—EDITOR.]

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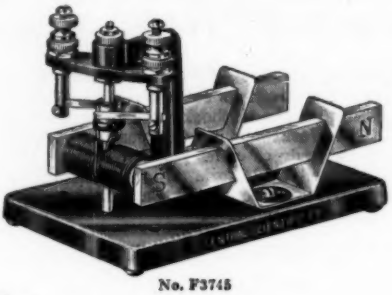

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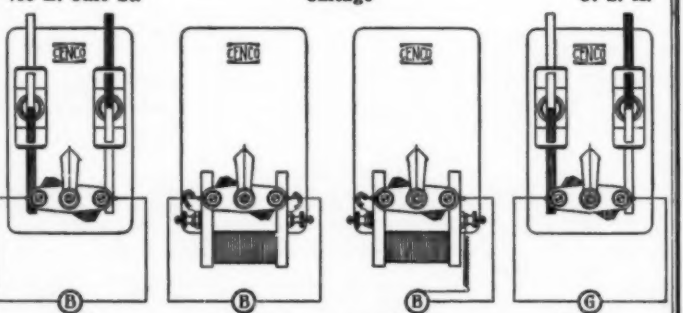

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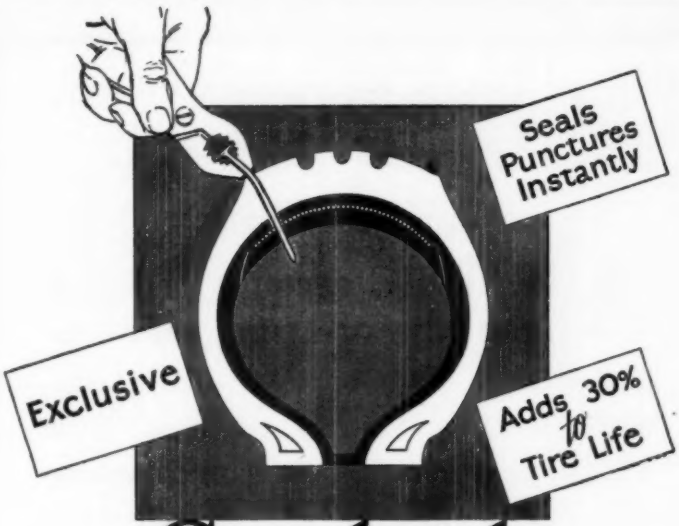

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